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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,259	06/11/2001	Michael Schmidt	MERCK-2272	8004

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EXAMINER

STOCKTON, LAURA LYNNE

ART UNIT PAPER NUMBER

1626

DATE MAILED: 02/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/877,259

Applicant(s)

SCHMIDT ET AL.

Examiner

Laura L. Stockton, Ph.D.

Art Unit

1626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 21-24 and 26-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

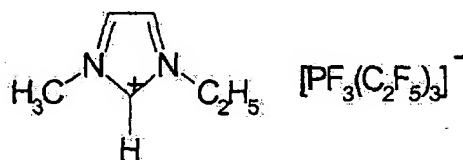
DETAILED ACTION

Claims 1-28 are pending in the application.

Election/Restrictions

Applicants' election with traverse of Group V and the species of Example 1 on page 21 (reproduced below) in the reply filed on December 1, 2004 is acknowledged.

Example 1



The traversal is on the ground(s) that: (1) the restriction requirement is extremely unjust after Applicants have Petitioned an improper restriction requirement; (2) since Applicants' have received two Office Actions on the merits, there seems little, if any, burden imposed in examining the full scope of Applicants' claimed genus; (3) the restriction is improper; (4) in the present case, it appears that the Examiner wishes

to restrict within a single claim and thus reject the claim on the basis of an allegedly improper Markush group; (5) no rationale is presented in the restriction requirement for restricting the instant claimed salts; and (6) various US patents that disclose salts with different heterocyclic cations have been grouped together.

All of Applicants' arguments have been considered but have not been found persuasive. As stated in the Restriction Requirement, dated November 15, 2004, the ionic liquids of Groups I-VIII differ materially in structure and element so much so as to be patentably distinct. Separate search considerations are involved for each of Groups I-VIII. See, for example, the different classes and subclasses assigned to each of the Groups. Therefore, it would impose an undue burden on the Examiner and the Office's resources to examine the instant application in its entirety. The traversal is on the ground(s) that it is improper for the Patent and Trademark Office to require a restriction within a single claim. However, Section 121 provides the Commissioner of Patents and Trademarks with the authority to restrict applications to several claimed

inventions when those inventions are found to be independent and distinct. In the instant application, the Examiner has determined that several independent and distinct inventions are claimed in the application. An improper Markush group rejection will not be made.

As per the Petition Decision dated July 30, 2004 on the restriction requirement dated February 10, 2003, the Petition was granted because it was determined that the restriction requirement was improper.

However, also in said Petition Decision it was acknowledged that "there are many core structures encompassed within Group I. The Examiner may reevaluate the propriety of a restriction requirement among said structures". Therefore, restriction between the various heterocyclic rings is proper. Further, the entire scope of elected Group V has been examined. The election of species requirement was for examination purposes only.

The requirement is still deemed proper and is therefore made
FINAL.

Subject matter not embraced by elected Group V and claims 21-24 and 26-28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions. Applicant timely traversed the restriction (election) requirement in the reply filed on December 1, 2004.

It is suggested that in order to advance prosecution, the non-elected subject matter be canceled when responding to this Office Action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C.

112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 25 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

No support is found in the originally filed claims or specification for the structure found in newly added claim 25. Applicants state that support is found on page 2 of the specification. However, the structure on page 2 of the specification is charged.

The following is a quotation of the second paragraph of 35 U.S.C.

112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-20 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and

distinctly claim the subject matter which applicant regards as the invention.

It would appear that claim 1 should read "A compound" instead of "An ionic liquid". See the preambles of dependent claims 2-7, 12-15, 19, 20 and 25. In claims 1, 3 and 14, it would appear that the comma in substituents " $N(C_nF_{(2n+1-x)},H_x)_2$ " and " $(C_nF_{(2n+1-x)},H_x)$ " should be deleted. Claims 2-7, 12-15, 19, 20 and 25 lack antecedent basis from claim 1 since claim 1 is directed to "An ionic liquid" instead of "A compound".

Response to Amendment

The Declaration under 37 CFR 1.132 filed June 4, 2004 is insufficient to overcome the rejection of claims 1-7, 12 and 13 based upon a 35 USC § 103 rejection over Koch et al. {U.S. Pat. 5,827,602} as set forth in the last Office action because in paragraphs numbered 2 and 3 on page 2 of the Declaration, additional pages are mentioned but were not provided with the Declaration, which had a total of 3 pages (including the signature page). Applicants did not compare any of the

exemplified compounds in the instant specification (e.g., Example 1 or Example 2 or Example 3 on page 21 of the instant specification).

Applicants have not identified, or compared, the closest prior art example. Applicant relying upon comparative showing to rebut *prima facie* case must compare his claimed invention with the closest prior art.

In re Holladay, 199 USPQ 516, 1978.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11, 14-18, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch et al. {U.S. Pat. 5,827,602} and in view of Heider et al. {U.S. Pat. 6,423,454}, Heider et al. {U.S. Pat. 6,548,212} and Hilarius et al. {US 2002/0015883}.

Determination of the scope and content of the prior art (MPEP §2141.01)

Applicants claim an ionic liquid of formula (I) wherein K^+ is a imidazolium ring and A^- is $[PF_x(C_yF_{2y+1-z}H_z)_{6-x}]^-$. Koch et al. (columns 1 and 2; Table 3 in columns 9-10; and especially Example V in column 8) teach ionic liquids that are structurally similar to the instant claimed liquids. Koch et al. teach an ionic liquid wherein the cation is an imidazolium (column 2, lines 40-45) and the anion is selected from $(CF_3)_2PF_4^-$, $(CF_3)_3PF_3^-$, $(CF_3)_4PF_2^-$, $(CF_3)_5PF^-$ and $(CF_3)_6P^-$ (column 3, lines 52-53).

Ascertainment of the difference between the prior art and the claims (MPEP §2141.02)

The difference between the teachings in Koch et al. and the instant claimed invention is that the instant claimed invention is generically described in Koch et al.

Finding of prima facie obviousness--rational and motivation (MPEP §2142-2413)

The indiscriminate selection of “some” among “many” is *prima facie* obvious, *In re Lemin*, 141 USPQ 814 (1964). The motivation to make the claimed compounds derives from the expectation that structurally similar compounds would possess similar activity (e.g., useful in batteries). Further, Heider et al. ‘454 (column 3, lines 52-59), Heider et al. ‘212 (column 1, lines 21-24; column 2, lines 13-27; and column 3, lines 2-37) and Hilarius et al. (page 1, paragraph [0009]; page 2, paragraphs [0034-0036]) each teach the benefit of having a conductive salt (e.g., LiPF_6 or LiBF_4) and an isocyanate in electrolyte compositions. Also see in the instant specification on page 4.

One skilled in the art would thus be motivated to prepare products embraced by Koch et al., and especially in view of the teachings in Heider et al. ‘454, Heider et al. ‘212 and Hilarius et al., to arrive at the instant claimed products with the expectation of obtaining additional beneficial products which would be useful in batteries. The instant

claimed invention would have been suggested and therefore, obvious to one skilled in the art. A strong case of *prima facie* obviousness has been established.

Response to Arguments

Applicants' arguments filed June 4, 2004 have been fully considered. Applicants argue that: (1) the disclosure of anions in Koch et al. presents a broad genus; (2) the specific embodiments disclosed in Koch et al. do not suggest a compound of the instant claimed invention; (3) the anions listed in Table 3 suggests away from the use of $(\text{CF}_3)_2\text{PF}_4^-$ due to its comparatively low van der Waals volume; and (4) the Declaration by Dr. Nikolai Ignatyev show unexpected results.

All of Applicants' arguments have been considered but have not been found persuasive. Although the teaching in Koch et al. may be considered broad to some, Koch et al. teach and suggest the instant claimed invention. See, for instance, the specific prepared imidazolium compounds of Examples I, III and V, and the anions taught in column 3,

lines 52-53 and in Table 3 in columns 9-10. It is well established that consideration of a reference is not limited to the preferred embodiments or working examples, but extends to the entire disclosure for what it fairly teaches, when viewed in light of the admitted knowledge in the art, to person of ordinary skill in the art. *In re Boe*, 148 USPQ 507, 510 (CCPA 1966). Further, Declaration by Dr. Nikolai Ignatyev has been discussed above. For all the reasons given above, the instant claimed invention is found to have been obvious over the cited prior art.

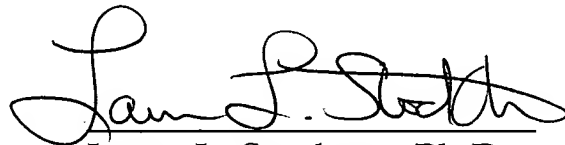
The elected species of Example 1, on page 21 of the instant specification, is allowable over the art of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura L. Stockton whose telephone number is (571) 272-0710. The examiner can normally be reached on Monday-Friday from 6:15 am to 2:45 pm. If the examiner is out of the Office, the examiner's supervisor, Joseph McKane, can be reached on (571) 272-0699.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from

either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

The Official fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

A handwritten signature in black ink, appearing to read "Laura L. Stockton", written over a horizontal line.

Laura L. Stockton, Ph.D.

Patent Examiner

Art Unit 1626, Group 1620

Technology Center 1600

February 15, 2005